

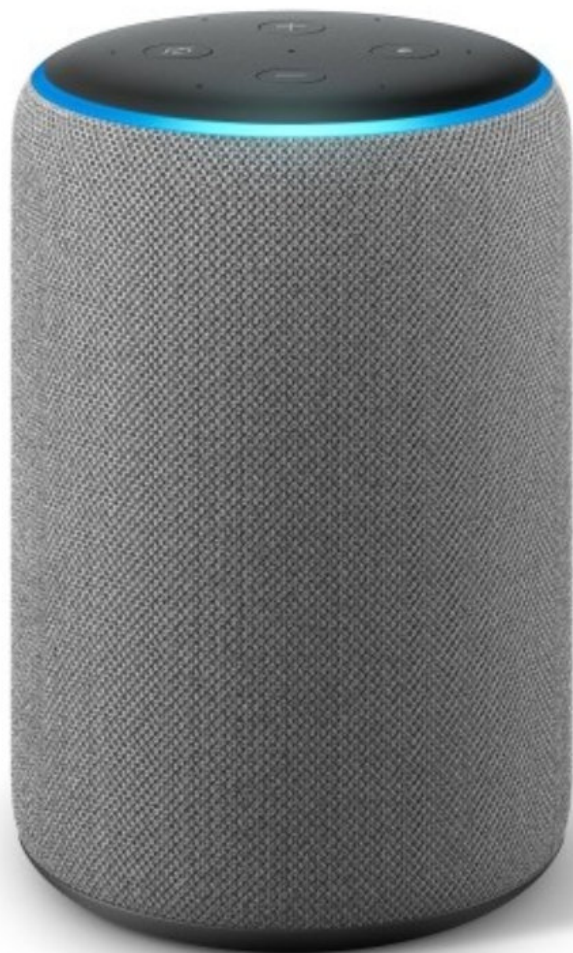


Fraunhofer-Institut für Verfahrenstechnik und
Verpackung IVV

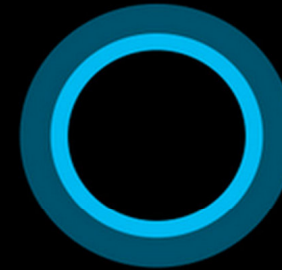
VVD-Anwenderforum 2018

Industrie 4.0 – Revolution durch maschinelles Lernen

Peter Seeberg
Berlin
24.10.2018

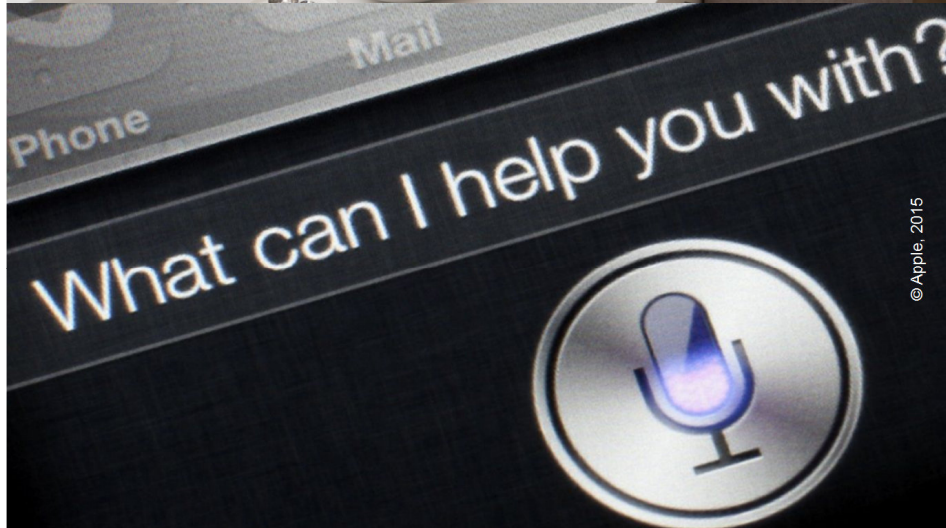


“Alexa”



© Microsoft, 2015

Hallo, ich bin Cortana.



Google

Say "Ok Google" 

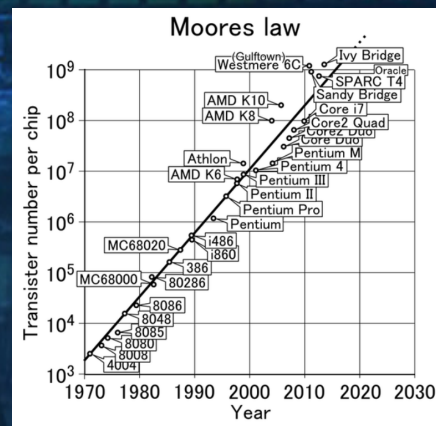
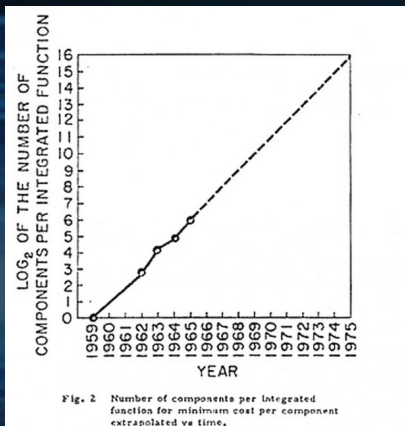
© Google, 2015



€

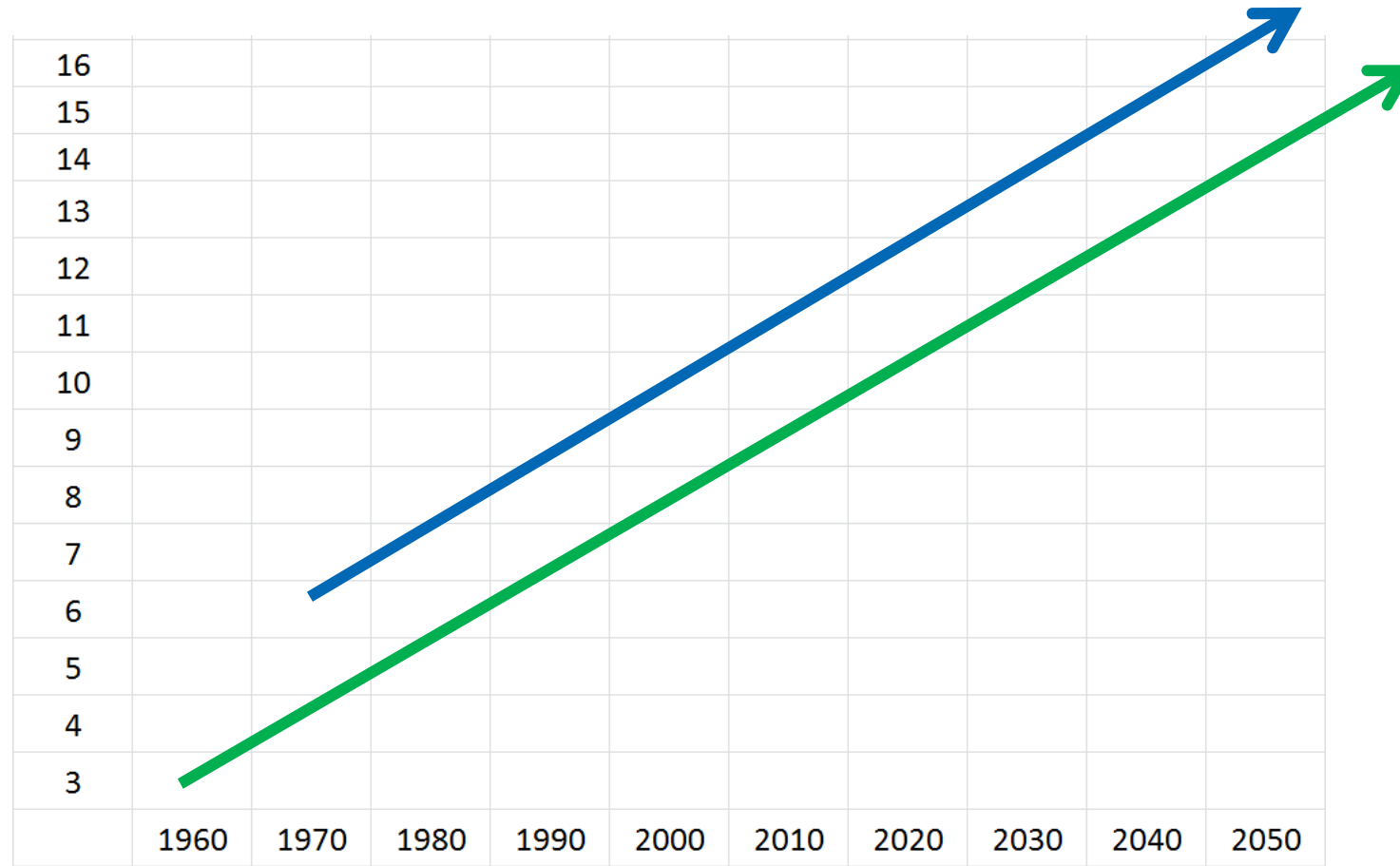


*"The number of transistors and resistors
on a chip doubles every 24 months"*
-Gordon Moore

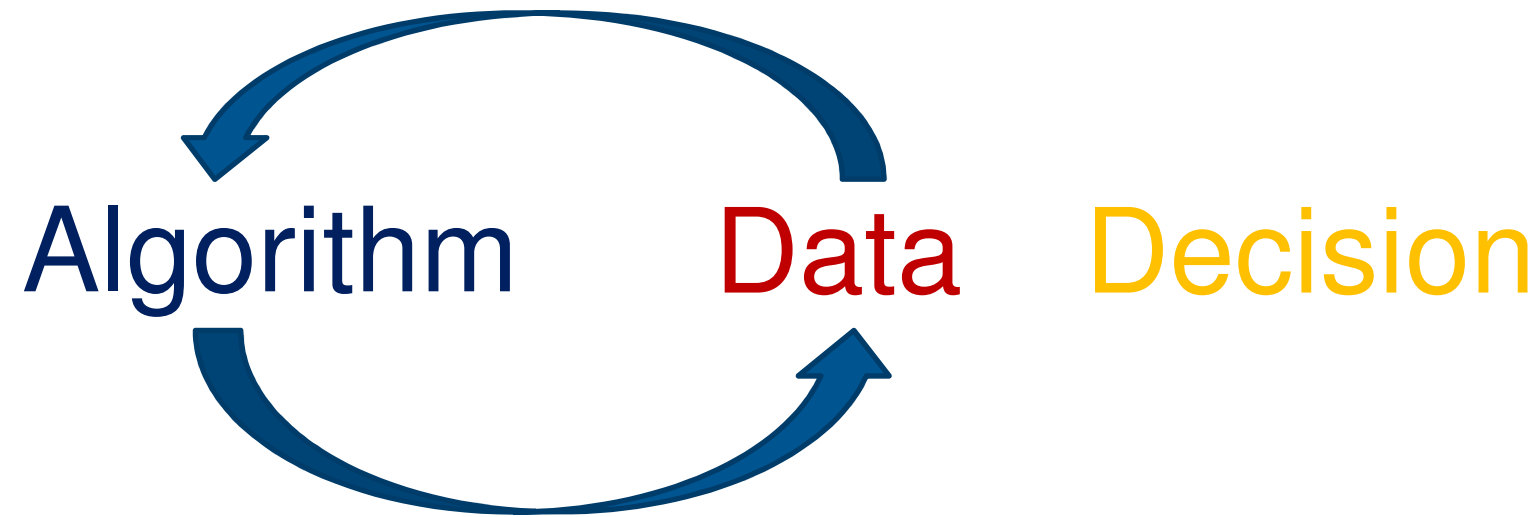


$10^{(x)}$ Transistors (Moore's Law)

$10^{(x)}$ Bytes



© Peter Seeberg, 2018



© Peter Seeberg, 2016

Algorithm

Data

Decision

© Peter Seeberg, 2016





Englisch ▾



The difference between the two approaches is rooted in the philosophical yet statically relevant "correlation vs. causality" discussion. While correlation represents a relationship between factors, which can be positive or negative, it does not imply causation. Often, causality is difficult to prove and requires special experimentation. [Bearbeiten](#)

Deutsch ▾



Der Unterschied zwischen den beiden Ansätzen liegt in der philosophisch-statisch relevanten Diskussion "Korrelation vs. Kausalität" begründet. Während die Korrelation eine Beziehung zwischen Faktoren darstellt, die positiv oder negativ sein kann, impliziert dies keine Kausalität. Die Kausalität ist oft schwer nachzuweisen und erfordert spezielle Experimente.

[In Google Übersetzer öffnen](#)

[Feedback](#)

izjave filozofa " Rene' Descartes-
a " ego cogito, ergo sum" .

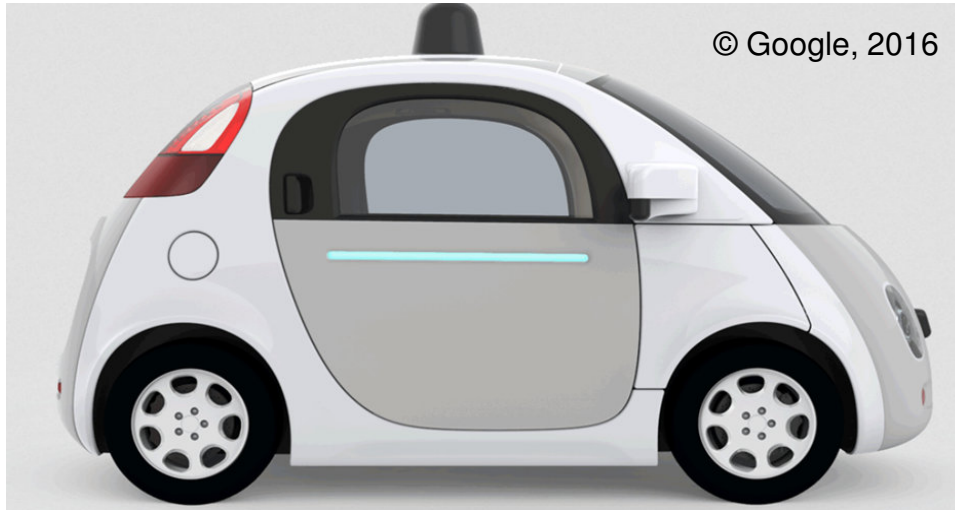
Naš će mozak , ako sve
prepustimo mašinama, uskoro
zakržljati. Strašna pretpostavka!
Ili? 🤔

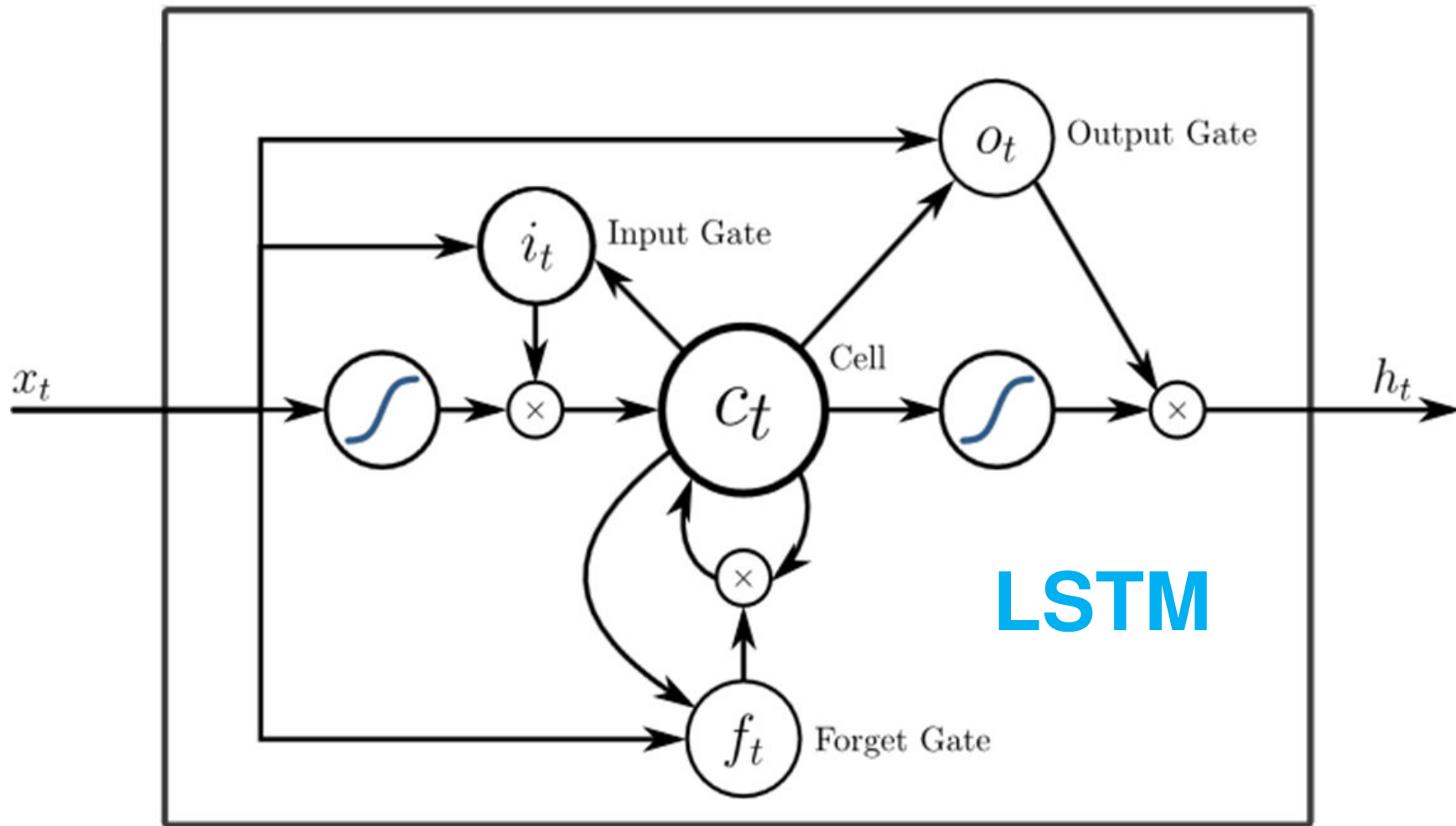
Kamera Handschrift Unterhaltung Spracheingabe

DEUTSCH ☆

die Aussagen des Philosophen
"Rene 'Descartes" ego cogito,
ergo sum " .

Unser Gehirn wird, wenn
wir alles den Maschinen
überlassen, bald erschüttert
sein. Schreckliche Annahme!
Oder? 🤔





© Sepp Hochreiter, Jürgen Schmidhuber, 1997, Felix Gers, 2000



Andrew Ng ✓ @AndrewYNg · 14 Std.

Posting with permission. AI people: What would you say to him?

Dear Andrew Ng,

I'm 3 years into specialist radiology training. Should I quit and do something else? I.e. How close are radiologists to being replaced?

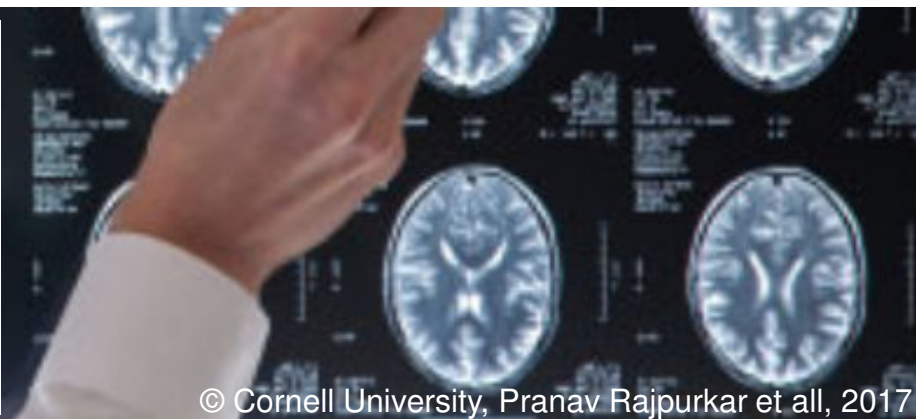
Many thanks

Dr [REDACTED]



Andrew Ng ✓ @Andrew... · 11 h ✓

Should radiologists be worried about their jobs? Breaking news: We can now diagnose pneumonia from chest X-rays better than radiologists.

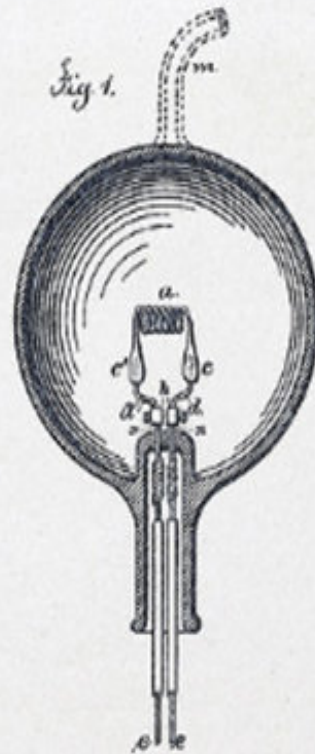


© Cornell University, Pranav Rajpurkar et al, 2017

T. A. EDISON.
Electric-Lamp.

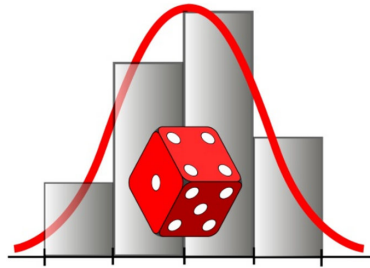
No. 223,898.

Patented Jan. 27, 1880



© Andrew Ng, 2017

Statistics.....



What happened?
Describing Analytics

Why did it happen?
Diagnostic Analytics

What will happen?
Forward-looking Analytics

What to do?
Prescriptive Analytics

Outlook
Optimization

Insight

Machine Learning

Data Mining....

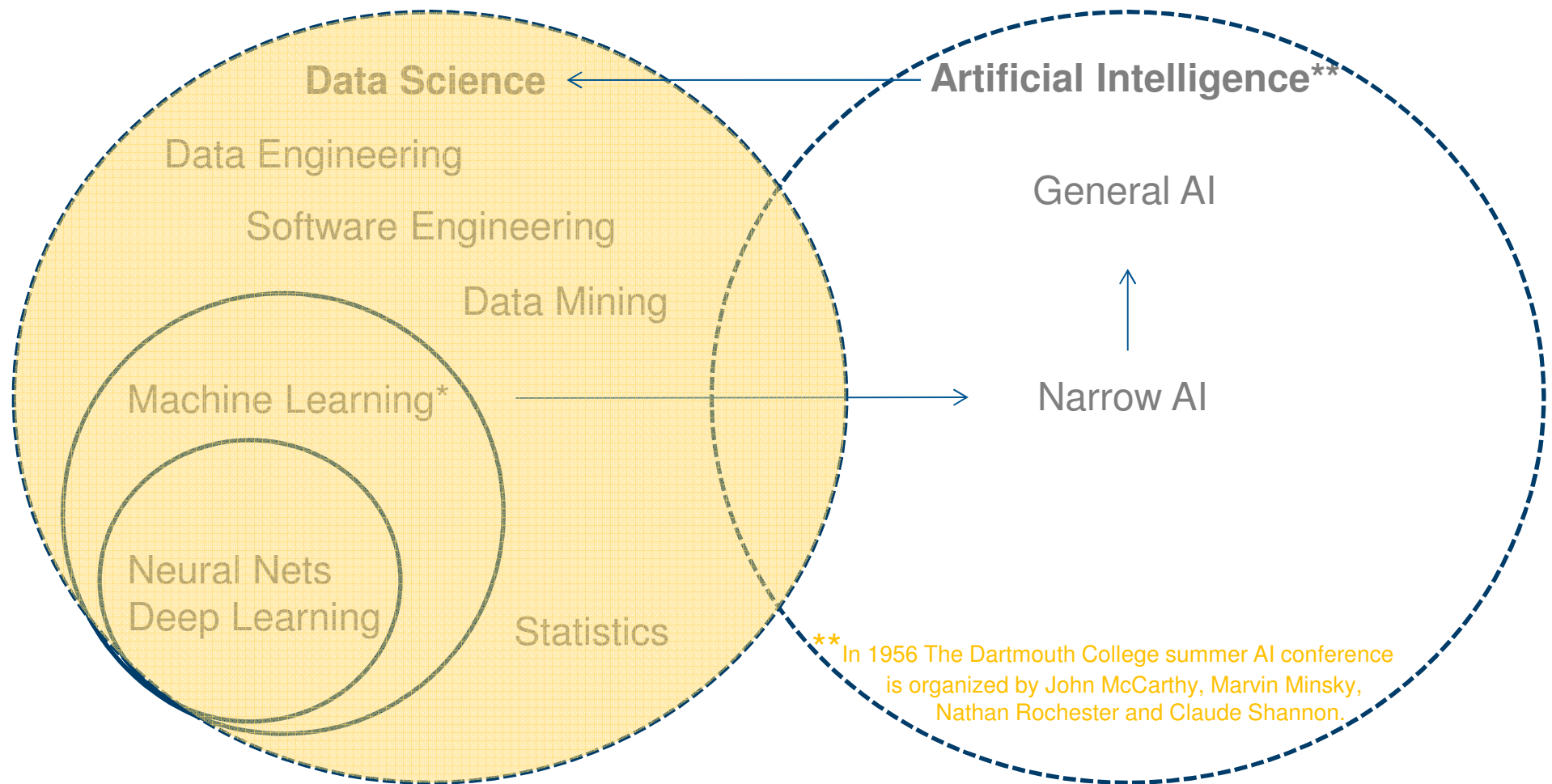
optimize!
softing

Industrial Data Intelligence

Datenbasierte Produktionsoptimierung

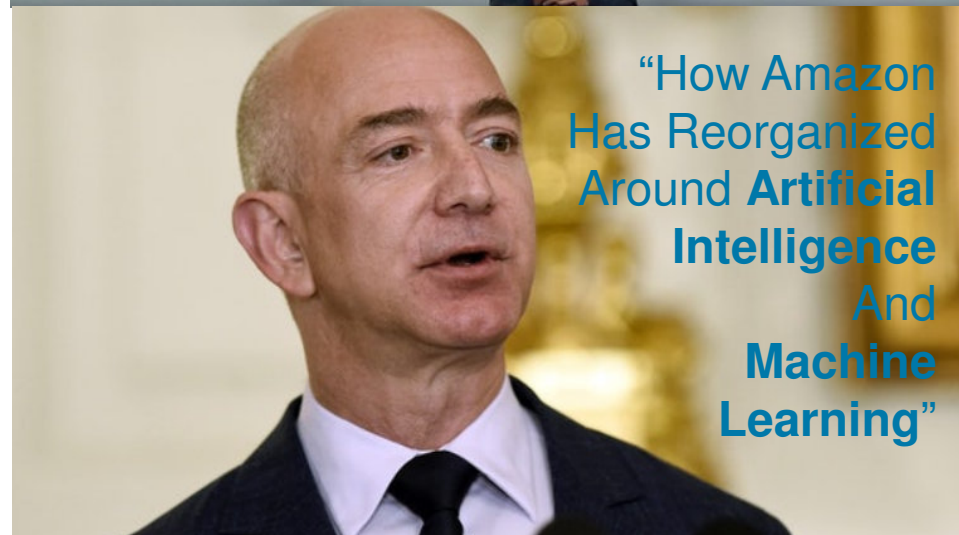
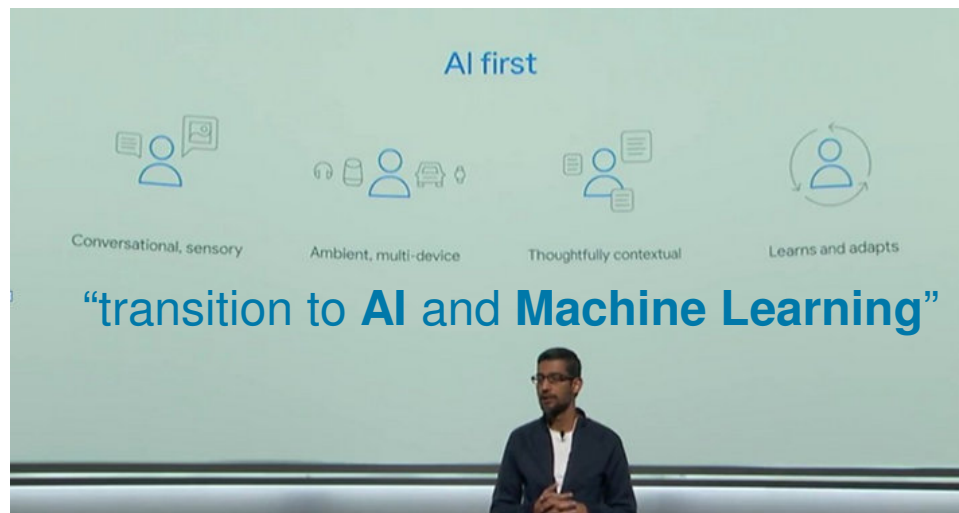
Review
Information

© Gartner Group, 2013



* In 1959 Arthur Samuel defined machine learning as a "Field of study that gives computers the ability to learn without being explicitly programmed"

** In 1956 The Dartmouth College summer AI conference is organized by John McCarthy, Marvin Minsky, Nathan Rochester and Claude Shannon.



We choose to go
to the moon in
this decade and do
the other things.
Not because they
are easy, but
because they are
hard.

- John F. Kennedy
September 12, 1962



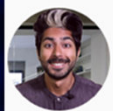
Software und Digitalisierung



Quick Guide

Machine Learning im Maschinen- und Anlagenbau

<https://sud.vdma.org/viewer/-/v2article/render/26018603>



Siraj Raval
189.408 Abonnenten



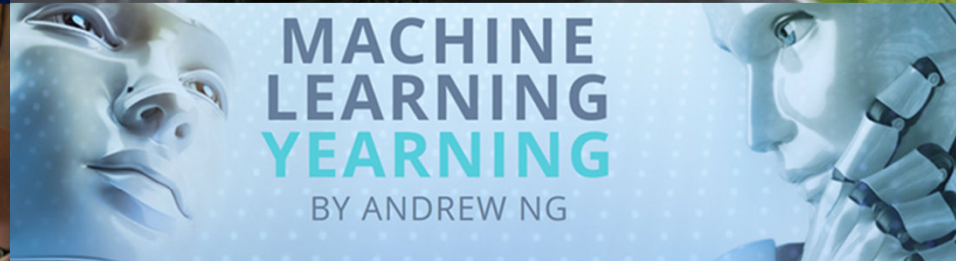
mooc.HOUSE



Gemeinsam online lernen.
Überall, jederzeit.



Sebastian Thrun
PRÄSIDENT VON UDACITY



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coursera



„I choose to introduce
ML / AI in 5 years.

Not because it is easy
but because there is
no other way, my
company can survive
and continue to be
successfull.“





Fraunhofer-Institut für Verfahrenstechnik und
Verpackung IVV

VVD-Anwenderforum 2018

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24.10.2018